Proposed Item for Biobased Designation

The following biobased product information has been collected to support item designation by USDA for the BioPreferred Program. This summary reflects data available as of September 12, 2008.

Title: Animal Repellents

Description: Products used to aid in deterring animals that cause destruction to plants and/or property.

Companies Supplying Item: 29 companies supplying Animal Repellents have been identified through internet searches, manufacturer's directories, trade associations, and company submissions.

Industry Associations Investigated: The following industry associations have been investigated for member companies supplying Animal Repellents:

- American Public Gardens Association
- Biodynamic Agricultural Association
- National Corn Growers Association
- National Gardening Association
- United Soybean Board

Commercially Available Products Identified: Of the companies identified, 109 Animal Repellents are commercially available on the market.

Product Information Collected: Specific product information including company contact, intended use, biobased content, and performance characteristics have been collected on 8 Animal Repellents.

Industry Performance Standards: Product information submitted by biobased manufacturers and suppliers indicate that have typically been tested to the following industry standards:

- No Results

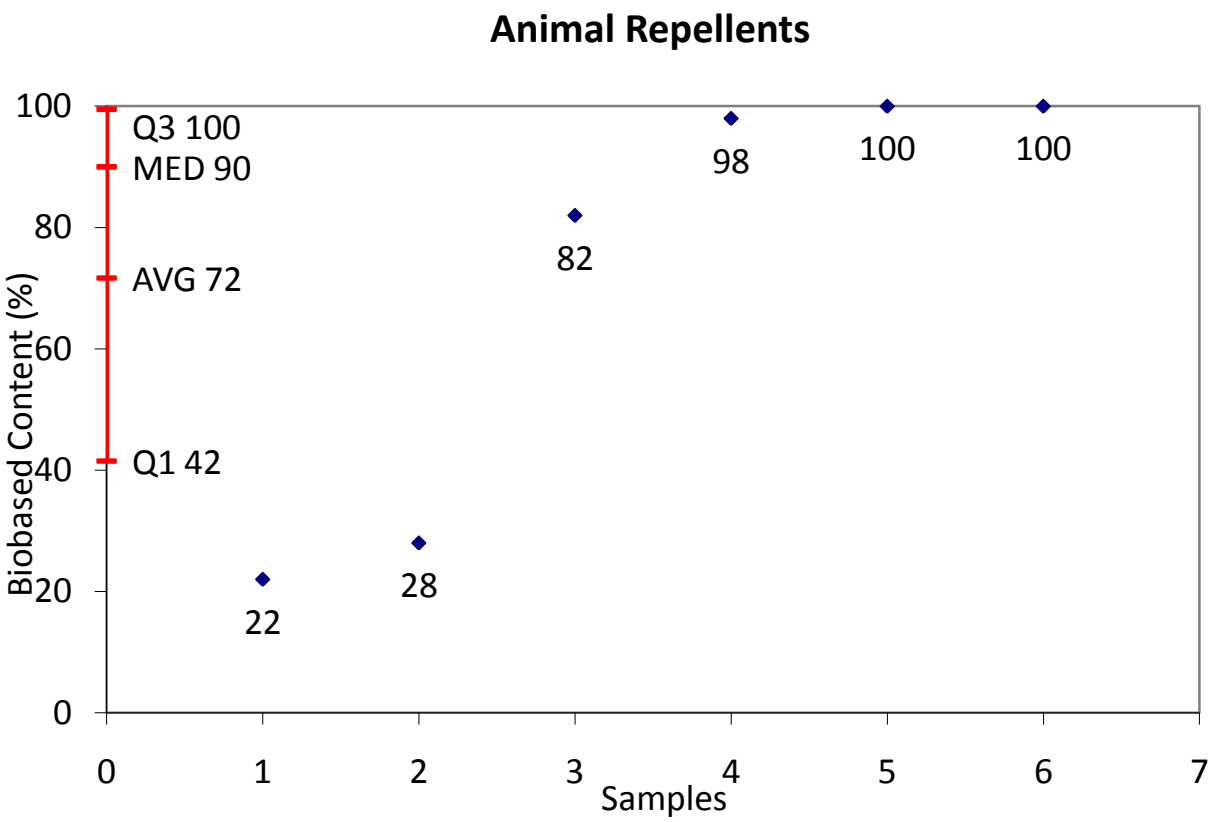
Samples Tested for Biobased Content: 6 samples of Animal Repellents have been submitted to independent laboratories for biobased content testing as specified by ASTM standard D6866-04.

Biobased Content Data: Results from biobased content testing of Animal Repellents indicate a range of content percentages from 22% minimum to 100% maximum biobased content as defined by ASTM D 6866-04. A detailed distribution of biobased content levels is included as Appendix A.

Products Submitted for BEES Analysis: Life-cycle cost and environmental effect data for 3 Animal Repellents have been submitted to NIST for BEES analysis.

BEES Analysis: The Animal Repellents that provided information for the BEES analysis had different applications so different functional units were used and the scores for each should not be compared. A detailed summary of the BEES results is included as Appendix B, C and D.

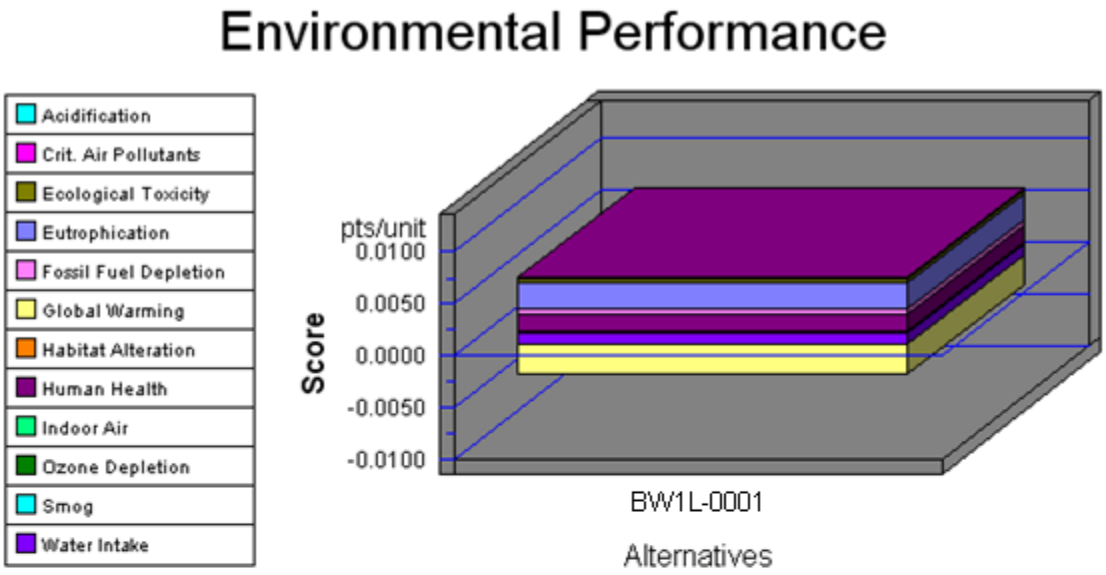
Appendix A - Biobased Content Data



	Company	Product	C14	BEES
1	G443	G443-0001	22	
2	V82H	V82H-0002	28	Yes
3	CH23	CH23-0010	82	
4	W1D6	W1D6-0001	98	Yes
5	BW1L	BW1L-0001	100	Yes
6	X994	X994-0001	100	

Appendix B - BEES Analysis Results Part 1

Functional Unit: Treating 4,000 sq ft for 30 days



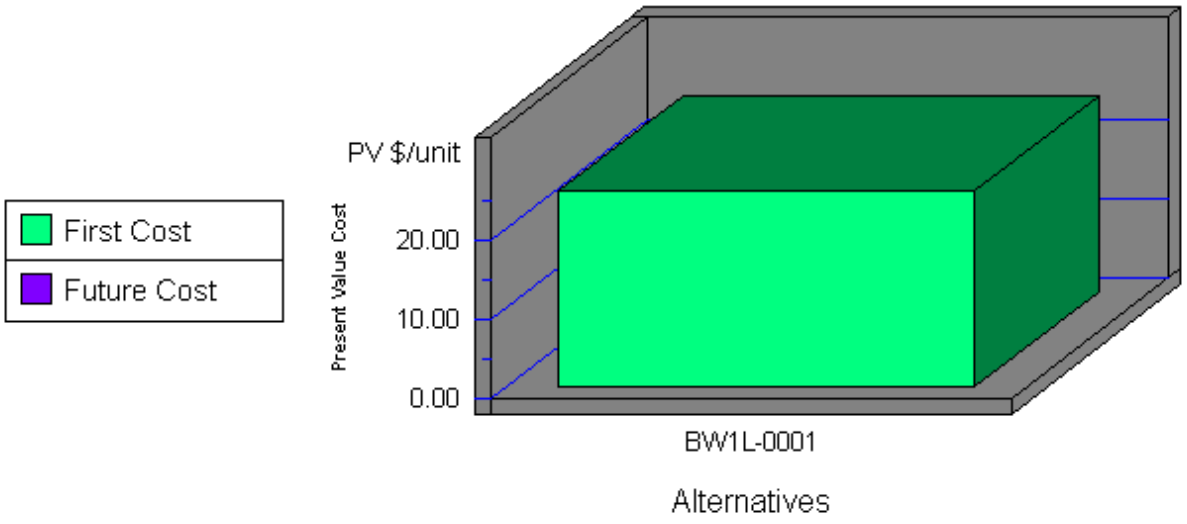
Note: Lower values are better

Category	BW1L-0001
Acidification--3%	0.0000
Crit. Air Pollutants--9%	0.0001
Ecolog. Toxicity--7%	0.0005
Eutrophication--6%	0.0024
Fossil Fuel Depl.--10%	0.0006
Global Warming--29%	-0.0028
Habitat Alteration--6%	0.0000
Human Health--13%	0.0015
Indoor Air--3%	0.0000
Ozone Depletion--2%	0.0000
Smog--4%	0.0003
Water Intake--8%	0.0011
Sum	0.0037

Animal Repellents Part 1		
Impacts	Units	BW1L-0001
Acidification	millimoles H^+ equivalents	8.08E+02
Criteria Air Polutants	microDALYs	1.10E-01
Ecotoxicity	g 2,4-D equivalents	6.10E+00
Eutrophication	g N equivalents	7.67E+00
Fossil Fuel Depletion	MJ surplus energy	2.08E+00
Global Warming	g CO_2 equivalents	-2.46E+03
Habitat Alteration	T&E count	0.00E+00
Human Health--Cancer	g C_6H_6 equivalents	9.45E-01
Human Health--NonCancer	g C_7H_8 equivalents	1.83E+03
Indoor Air Quality	g TVOCs	0.00E+00
Ozone Depletion	g CFC-11 equivalents	7.71E-06
Smog	g NO_x equivalents	1.30E+01
Water Intake	liters of water	7.08E+01
Functional Unit	----------	Treating 4,000 sq feet for 30 days

1 Following are more complete descriptions of units: Acidification: millimoles of hydrogen ion equivalents; Criteria Air Pollutants: micro Disability-Adjusted Life Years; Ecological Toxicity: grams of 2,4-dichlorophenoxy-acetic acid equivalents; Eutrophication: grams of nitrogen equivalents; Fossil Fuel Depletion: megajoules of surplus energy; Global Warming: grams of carbon dioxide equivalents; Habitat Alteration: threatened and endangered species count;Human Health-Cancer: grams of benzene equivalents; Human Health-NonCancer: grams of toluene equivalents; Indoor Air Quality: grams of Total Volatile Organic Compounds; Ozone Depletion: grams of chloroflourocarbon-11 equivalents; Smog: grams of nitrogen oxide equivalents; and Water Intake: liters of water.

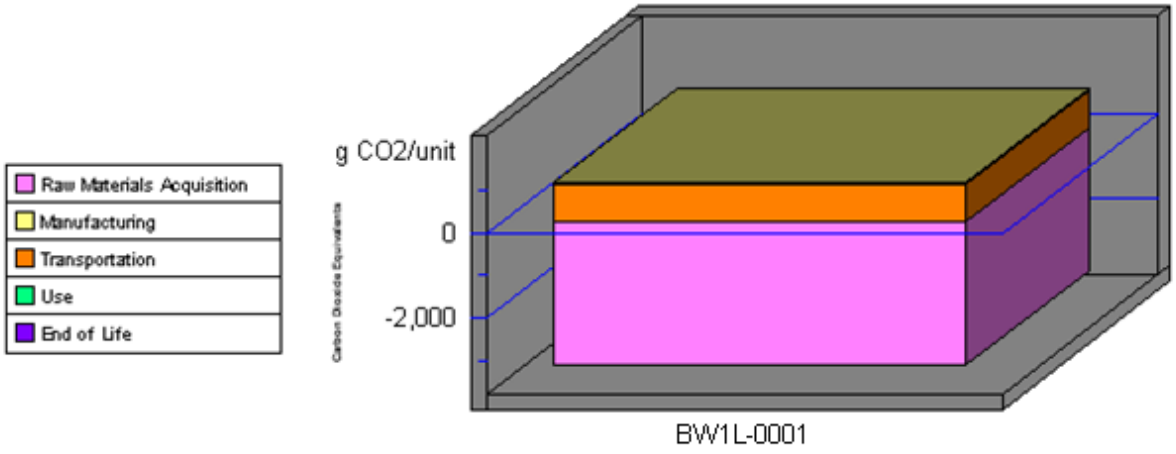
Economic Performance



Category	BW1L-0001
First Cost	24.99
Future Cost-- 3.0%	0.00
Sum	24.99

*This is a consumable product. Therefore, future costs are not calculated.

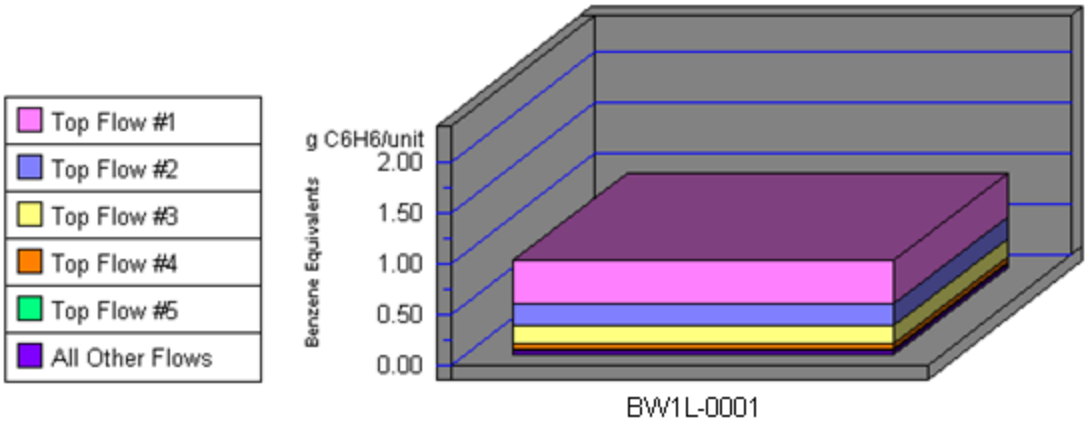
Global Warming by Life-Cycle Stage



Note: Lower values are better

Category	BW1L-0001
1. Raw Materials	-3357
2. Manufacturing	36
3. Transportation	860
4. Use	0
5. End of Life	0
Sum	-2461

Human Health Cancer by Sorted Flows*

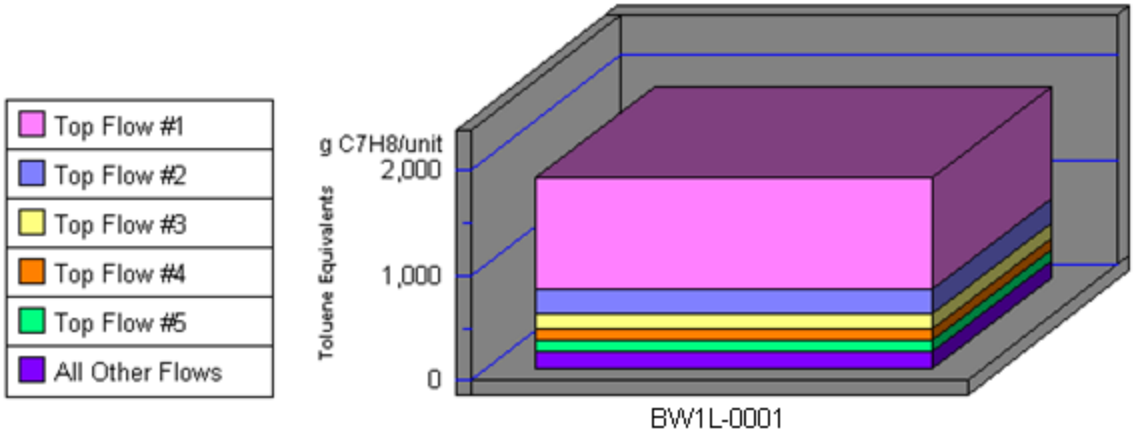


Note: Lower values are better

Category	BW1L-0001
Cancer--(w) Arsenic (As3+, As5+	0.44
Cancer--(w) Phenol (C6H5OH)	0.21
Cancer--(a) Dioxins (unspecifie	0.19
Cancer--(a) Arsenic (As)	0.05
Cancer--(a) Triallate (C10H16Cl	0.02
All Others	0.04
Sum	0.94

*Sorted by five topmost flows for worst-scoring product

Human Health Noncancer by Sorted Flows*



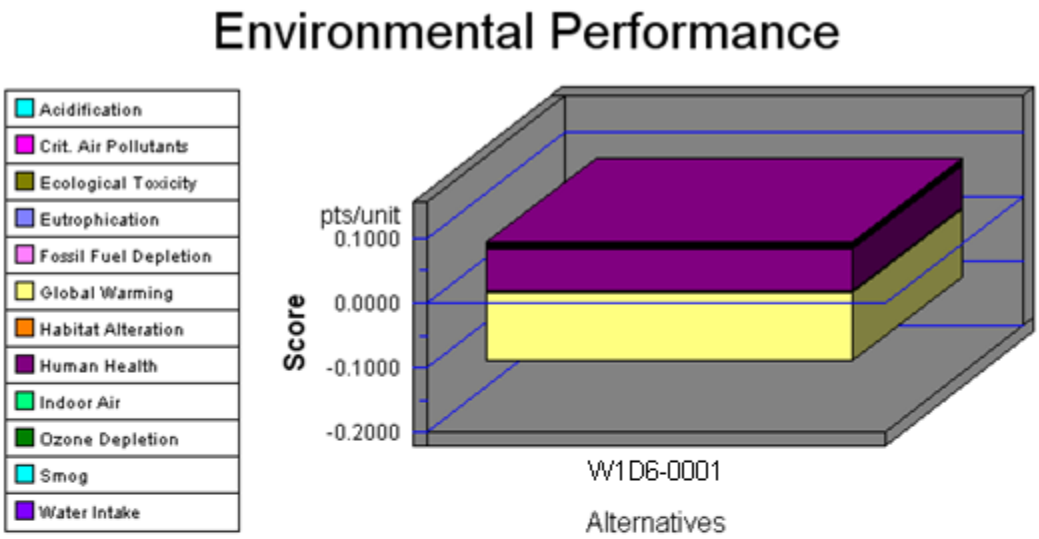
Note: Lower values are better

Category	BW1L-0001
Noncancer--(w) Mercury (Hg+, Hg	1,058.68
Noncancer--(a) Dioxins (unspeci	240.19
Noncancer--(w) Barium (Ba++)	147.75
Noncancer--(w) Lead (Pb++, Pb4+	100.75
Noncancer--(a) Mercury (Hg)	100.71
All Others	178.09
Sum	1,826.17

*Sorted by five topmost flows for worst-scoring product

Appendix C - BEES Analysis Results Part 2

Functional Unit: Treating 100 square feet for 30 days



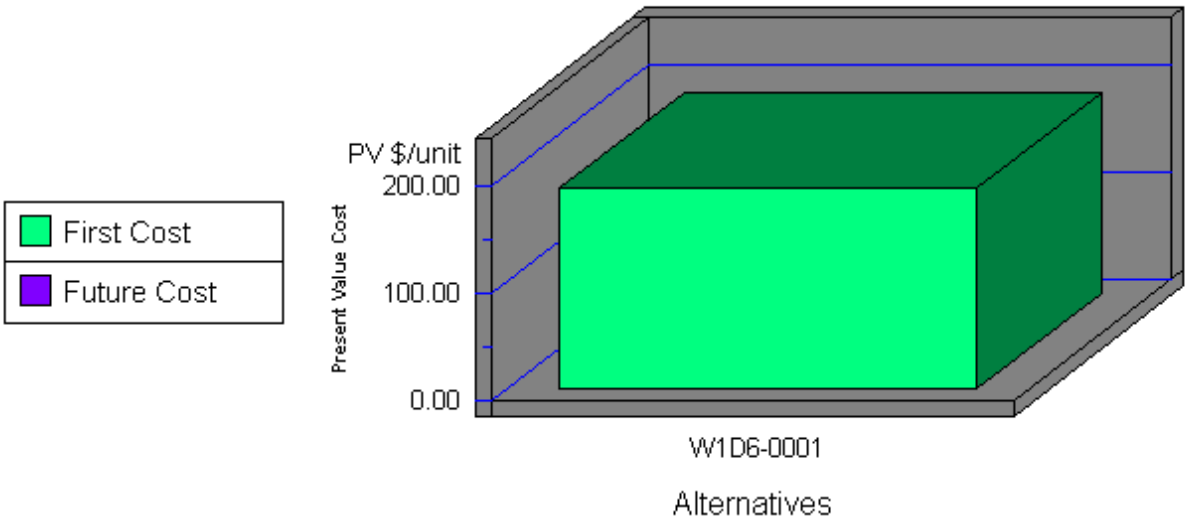
Note: Lower values are better

Category	W1D6-0001
Acidification--3%	0.0000
Crit. Air Pollutants--9%	0.0014
Ecolog. Toxicity--7%	0.0042
Eutrophication--6%	0.0017
Fossil Fuel Depl.--10%	0.0029
Global Warming--29%	-0.1046
Habitat Alteration--6%	0.0000
Human Health--13%	0.0632
Indoor Air--3%	0.0000
Ozone Depletion--2%	0.0000
Smog--4%	0.0028
Water Intake--8%	0.0001
Sum	-0.0283

Animal Repellents Part 2		
Impacts	Units	W1D6-0001
Acidification	millimoles H^+ equivalents	6.06E+03
Criteria Air Polutants	microDALYs	2.95E+00
Ecotoxicity	g 2,4-D equivalents	4.87E+01
Eutrophication	g N equivalents	5.44E+00
Fossil Fuel Depletion	MJ surplus energy	1.04E+01
Global Warming	g CO_2 equivalents	-9.23E+04
Habitat Alteration	T&E count	0.00E+00
Human Health--Cancer	g C_6H_6 equivalents	4.02E+01
Human Health--NonCancer	g C_7H_8 equivalents	5.24E+04
Indoor Air Quality	g TVOCs	0.00E+00
Ozone Depletion	g CFC-11 equivalents	1.61E-03
Smog	g NO_x equivalents	1.08E+02
Water Intake	liters of water	9.00E+00
Functional Unit	----------	Treating 100 square feet for 30 days

1 Following are more complete descriptions of units: Acidification: millimoles of hydrogen ion equivalents; Criteria Air Pollutants: micro Disability-Adjusted Life Years; Ecological Toxicity: grams of 2,4-dichlorophenoxy-acetic acid equivalents; Eutrophication: grams of nitrogen equivalents; Fossil Fuel Depletion: megajoules of surplus energy; Global Warming: grams of carbon dioxide equivalents; Habitat Alteration: threatened and endangered species count;Human Health-Cancer: grams of benzene equivalents; Human Health-NonCancer: grams of toluene equivalents; Indoor Air Quality: grams of Total Volatile Organic Compounds; Ozone Depletion: grams of chloroflourocarbon-11 equivalents; Smog: grams of nitrogen oxide equivalents; and Water Intake: liters of water.

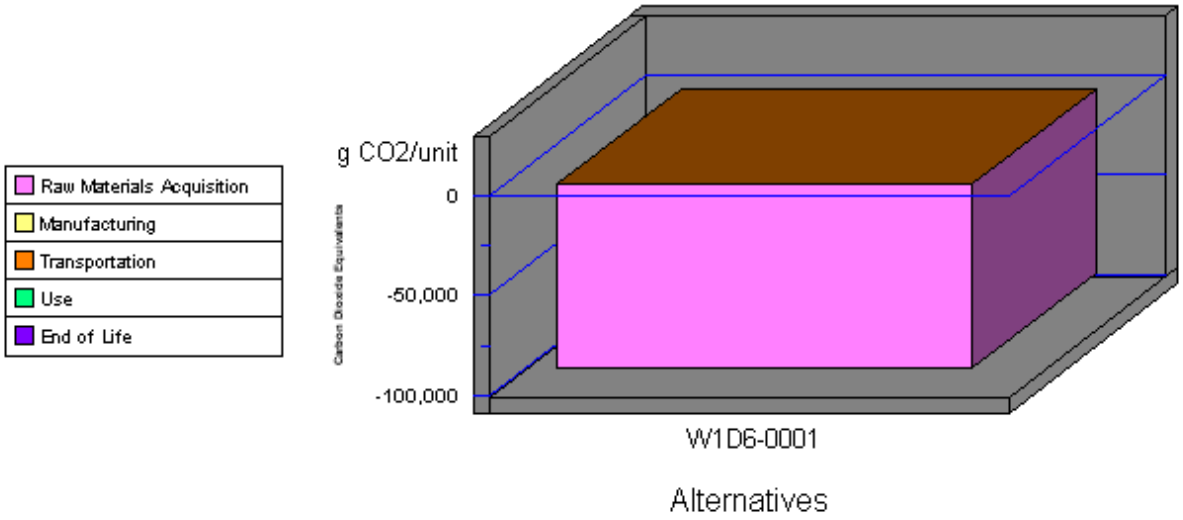
Economic Performance



Category	W1D6-0001
First Cost	186.88
Future Cost-- 3.0%	0.00
Sum	186.88

*This is a consumable product. Therefore, future costs are not calculated.

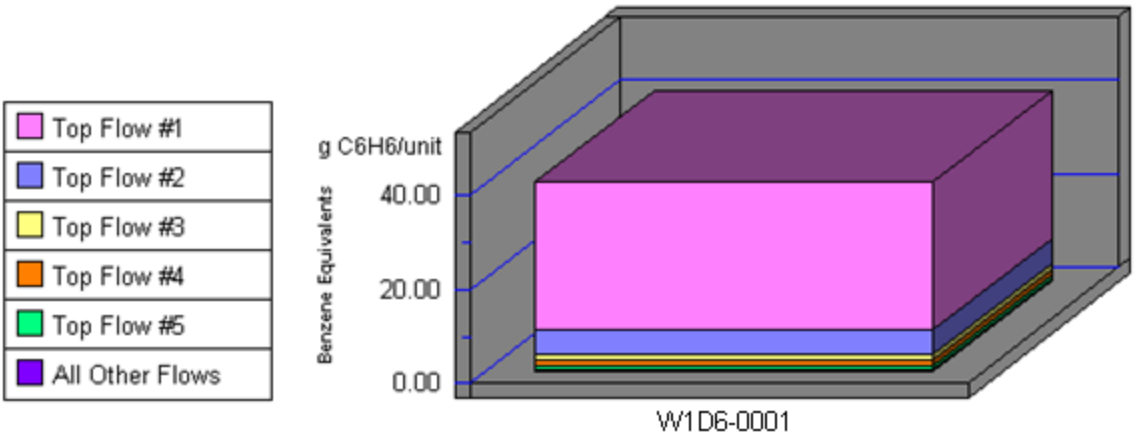
Global Warming by Life-Cycle Stage



Note: Lower values are better

Category	W1D6-0001
1. Raw Materials	-92532
2. Manufacturing	52
3. Transportation	197
4. Use	0
5. End of Life	0
Sum	-92284

Human Health Cancer by Sorted Flows*

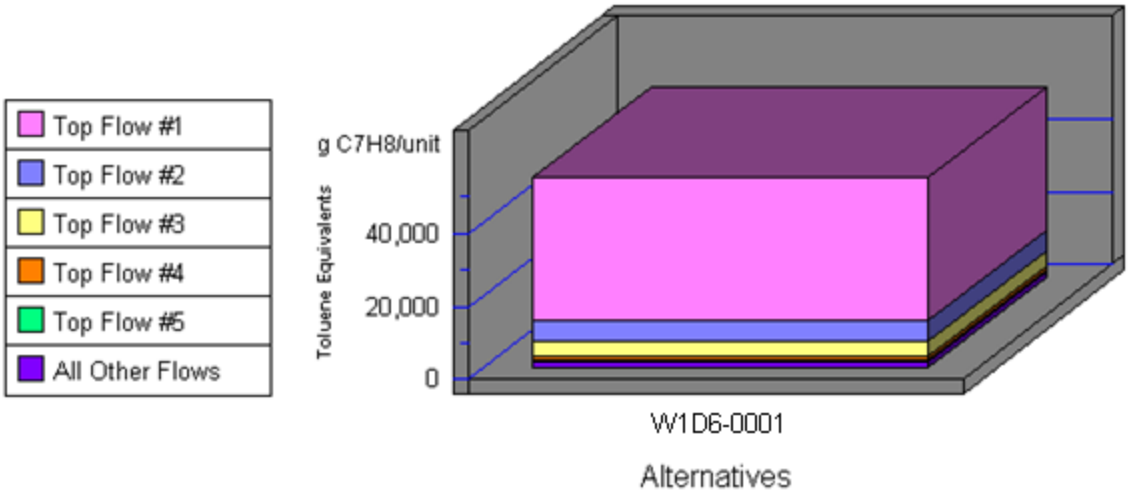


Note: Lower values are better

Category	W1D6-0001
Cancer--(a) Dioxins (unspecifie	31.16
Cancer--(a) Arsenic (As)	5.23
Cancer--(a) Carbon Tetrachlorid	1.20
Cancer--(w) Arsenic (As3+, As5+	1.07
Cancer--(w) Phenol (C6H5OH)	1.00
All Others	0.55
Sum	40.20

*Sorted by five topmost flows for worst-scoring product

Human Health Noncancer by Sorted Flows*



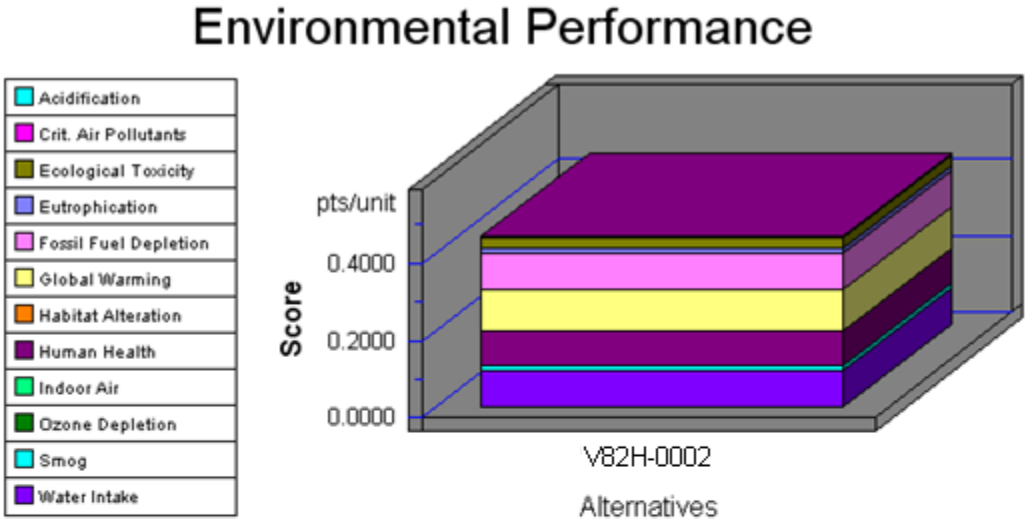
Note: Lower values are better

Category	W1D6-0001
Noncancer--(a) Dioxins (unspeci	39,251.06
Noncancer--(a) Mercury (Hg)	5,937.30
Noncancer--(a) Lead (Pb)	3,724.04
Noncancer--(a) Cadmium (Cd)	1,292.39
Noncancer--(w) Barium (Ba++)	472.58
All Others	1,756.73
Sum	52,434.10

*Sorted by five topmost flows for worst-scoring product

Appendix D - BEES Analysis Results Part 3

Functional Unit: Treating 24 acres for 30 days



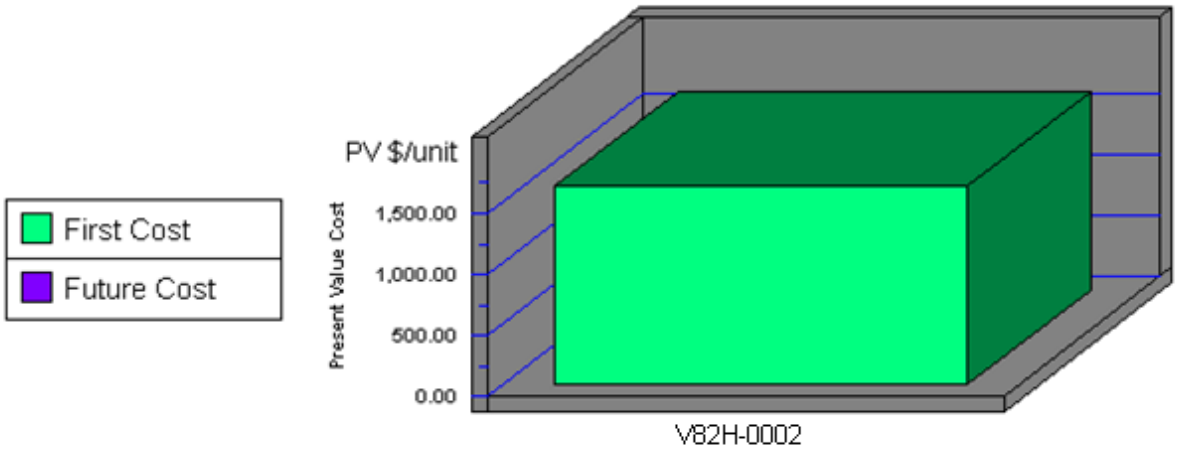
Note: Lower values are better

Category	V82H-0002
Acidification--3%	0.0000
Crit. Air Pollutants--9%	0.0042
Ecolog. Toxicity--7%	0.0277
Eutrophication--6%	0.0148
Fossil Fuel Depl.--10%	0.0904
Global Warming--29%	0.1078
Habitat Alteration--6%	0.0000
Human Health--13%	0.0886
Indoor Air--3%	0.0000
Ozone Depletion--2%	0.0000
Smog--4%	0.0161
Water Intake--8%	0.0949
Sum	0.4445

Animal Repellents Part 3		
Impacts	Units	V82H-0002
Acidification	millimoles H^+ equivalents	3.82E+04
Criteria Air Polutants	microDALYs	9.05E+00
Ecotoxicity	g 2,4-D equivalents	3.24E+02
Eutrophication	g N equivalents	4.72E+01
Fossil Fuel Depletion	MJ surplus energy	3.19E+02
Global Warming	g CO_2 equivalents	9.51E+04
Habitat Alteration	T&E count	0.00E+00
Human Health--Cancer	g C_6H_6 equivalents	5.67E+01
Human Health--NonCancer	g C_7H_8 equivalents	5.33E+04
Indoor Air Quality	g TVOCs	0.00E+00
Ozone Depletion	g CFC-11 equivalents	3.10E-05
Smog	g NO_x equivalents	6.09E+02
Water Intake	liters of water	6.29E+03
Functional Unit	----------	Treating 24 acres for 30 days

1 Following are more complete descriptions of units: Acidification: millimoles of hydrogen ion equivalents; Criteria Air Pollutants: micro Disability-Adjusted Life Years; Ecological Toxicity: grams of 2,4-dichlorophenoxy-acetic acid equivalents; Eutrophication: grams of nitrogen equivalents; Fossil Fuel Depletion: megajoules of surplus energy; Global Warming: grams of carbon dioxide equivalents; Habitat Alteration: threatened and endangered species count;Human Health-Cancer: grams of benzene equivalents; Human Health-NonCancer: grams of toluene equivalents; Indoor Air Quality: grams of Total Volatile Organic Compounds; Ozone Depletion: grams of chloroflourocarbon-11 equivalents; Smog: grams of nitrogen oxide equivalents; and Water Intake: liters of water.

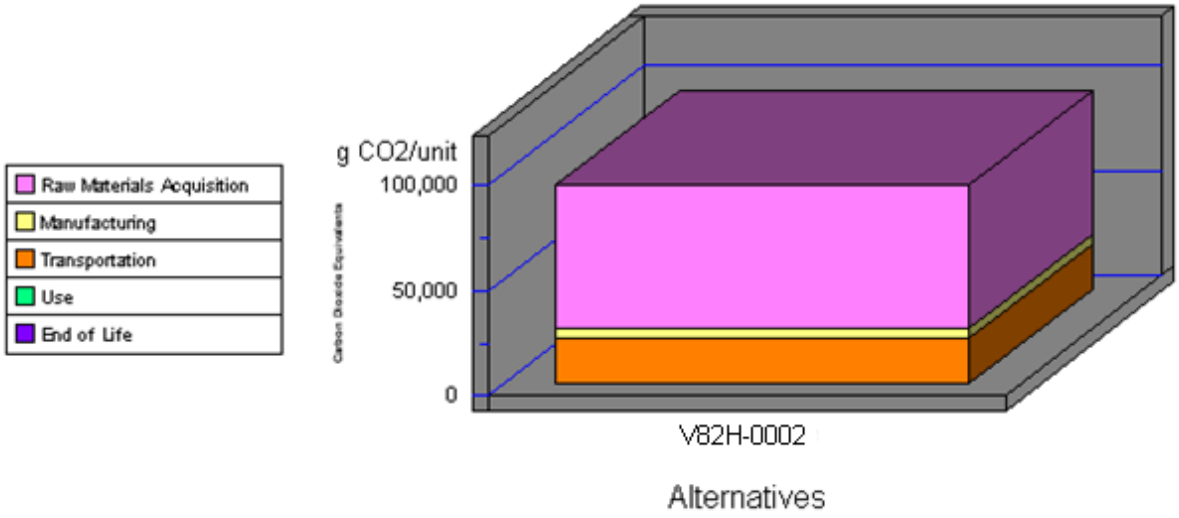
Economic Performance



Category	V82H-0002
First Cost	1634.14
Future Cost-- 3.0%	0.00
Sum	1634.14

*This is a consumable product. Therefore, future costs are not calculated.

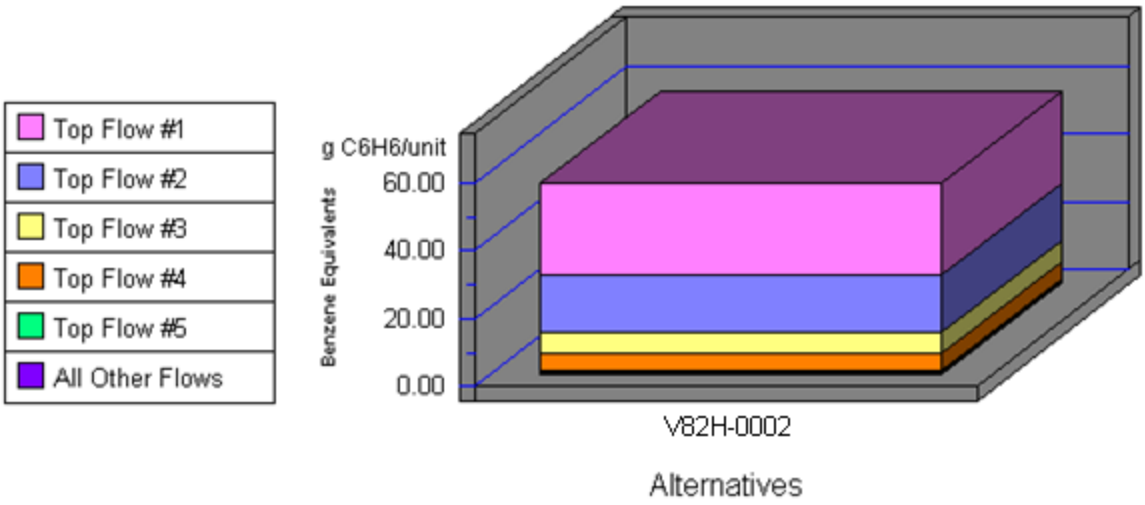
Global Warming by Life-Cycle Stage



Note: Lower values are better

Category	V82H-0002
1. Raw Materials	68521
2. Manufacturing	4373
3. Transportation	22228
4. Use	0
5. End of Life	0
Sum	95123

Human Health Cancer by Sorted Flows*

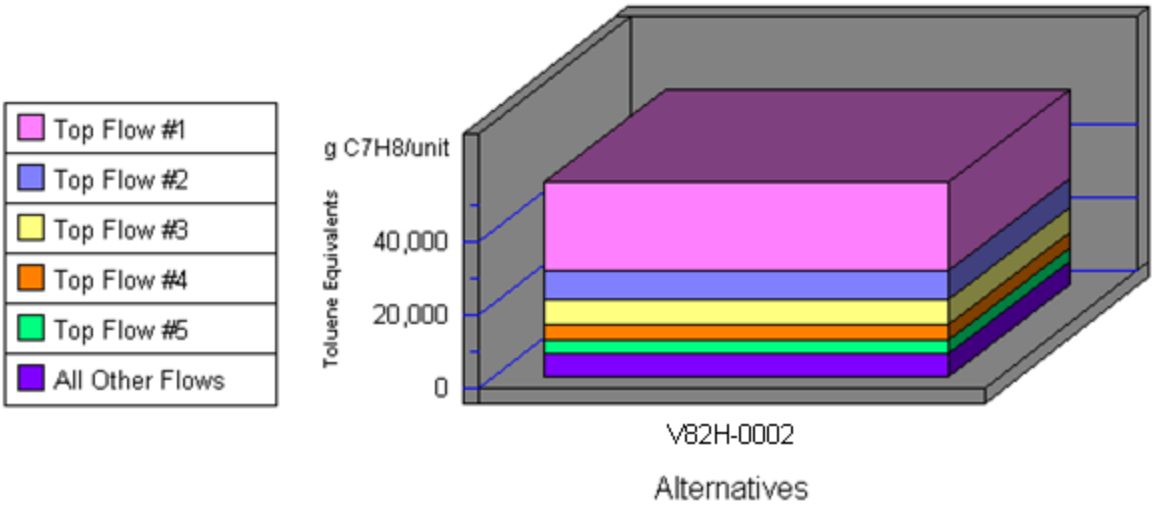


Note: Lower values are better

Category	V82H-0002
Cancer--(w) Phenol (C6H5OH)	27.46
Cancer--(w) Arsenic (As3+, As5+	16.40
Cancer--(a) Dioxins (unspecifie	6.25
Cancer--(a) Arsenic (As)	5.12
Cancer--(a) Benzene (C6H6)	0.81
All Others	0.68
Sum	56.73

*Sorted by five topmost flows for worst-scoring product

Human Health Noncancer by Sorted Flows*



Note: Lower values are better

Category	V82H-0002
Noncancer--(a) Mercury (Hg)	24,228.77
Noncancer--(a) Dioxins (unspeci	7,875.88
Noncancer--(w) Barium (Ba++)	7,027.39
Noncancer--(a) Lead (Pb)	3,888.70
Noncancer--(w) Lead (Pb++, Pb4+	3,765.56
All Others	6,553.97
Sum	53,340.27

*Sorted by five topmost flows for worst-scoring product